REMARKS

Applicants have amended claims 2, 14, 18, 21 and 27 to correct inadvertent errors and without changing the scope of the claims.

The Examiner stated:

> It is noted that Claim 14 contains an amendment by adding a period (.) at the end of the claim. However, the immediate prior version of Claim 14 already contains a period (.) at the end of the claim.
>
> It is noted that Claim 27 contains an amendment that is submitted without markings to indicate the changes that have been made relative to the immediate prior version of the claim.

Applicants have amended claim 14 to remove the added period.

Applicants have checked PAIR, and Applicants respectfully submit that claim 27 in PAIR includes markings to indicate the changes that have been made relative to the immediate prior version of the claim.

As such, Applicants respectfully submit that the issues Examiner has raised have been addressed.

The Examiner objected to claims 18, 21 and 27. In particular, the Examiner stated:

> **Claims 18, 21, and 27** are objected to because of the following informalities:
>
> - **Claims 18, 21, and 27** contain a typographical error: "[L]oopback" should read --loop-back--.
>
> - **Claim 27** contains a typographical error: The semicolon (;) at the end of the limitation "an imaging client installed in the memory of the first computer [...]" should be changed to a colon (:).
>
> Appropriate correction is required.

Applicants have amended claims 18, 21 and 27 in accordance with the Examiner's suggestions.

As such, Applicants respectfully request that the Examiner withdraw these objections.

Claims 16 and 27 are rejected under 35 U.S.C. 112, second paragraph. In particular, the Examiner stated:

> **Claims 16 and** 27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

Claim 16 recites the limitation "the imaging client" in "mediating [...] sector-based I/O requests between the imaging client and the source disk." There is insufficient antecedent basis for this limitation in the claim. In the interest of compact prosecution, the Examiner subsequently interprets this limitation as reading "the imaging client program" for the purpose of further examination.

Claim 27 recites the limitation "the file system." There is insufficient antecedent basis for this limitation in the claim. In the interest of compact prosecution, the Examiner subsequently interprets this limitation as reading "a file system" for the purpose of further examination. Applicant has inadvertently deleted the word "the" from the limitation "the file system drivers" in attempting to overcome the rejection. However, the limitation "the file system drivers" has sufficient antecedent basis. The claim is not rejected as being indefinite for this limitation.

As to claim 16: Applicants respectfully submit that claim 16 includes the limitation: "mediating, by the operating system, sector-based I/O requests between the imaging client and the source disk." Applicants submit that this is the same as "the operating system mediating .... As such, Applicants submit that claim 16 meets the requirements of 35 U.S.C. 112, second paragraph.

As to claim 27: Applicants have amended claim 27 to correct the lack of antecedent basis for the term "the file system." As such, Applicants submit that amended claim 27 meets the requirements of 35 U.S.C. 112, second paragraph.

In light of the above, Applicants respectfully request that the Examiner withdraw this rejection.

Claims 2-5 and 18-20 are rejected under 35 U.S.C. 102(e). In particular, the Examiner stated:

Claims 2-5 and 18-20 are rejected under 35 U.S.C. 102(e) as being anticipated by **US 6,477,624 (hereinafter "Kedem")**.

As per **Claim** 3, Kedem discloses:

- loop-back mounting a simulated source disk in the second computer so that the simulated source disk is accessible by the operating system as a local disk (see Column 8: 26-28, "To OS 102 and BIOS 104, LDIM 202 "pretends" that it is storage device 110. Thus, LDIM 202 is completely transparent to OS 102 and BIOS 104."; Column 9: 2-4, "In the former case, LDIM 202 emulates the selected image including the geometry of the image."); and

- configuring the simulated source disk as a proxy for the source disk by intercepting sector-based I/O requests directed to the simulated source disk and retrieving source disk data from the source disk according to the intercepted sector-based I/O requests (see Column 3: 62-67 to Column 4: 1-3, "The purpose of the LDIM is to imitate the LPSD. That is, the LDIM, from the computer's perspective, appears exactly like the LPSD. More specifically, the LDIM functions to intercept and process requests that are intended to be

received by the LPSD, which may not be in fact installed in the computer.": Column 9: 9-15, "... LDIM 202 functions to intercept requests (for example, read/write requests) that are intended to be received by storage device 110. After a master data image is selected, upon intercepting a read request, LDIM 202 is programmed to determine whether the cached data image or the selected master data image has the most up to date version of the requested data." and 28-32, "If LDIM 202 determines that the cached data image has the most up to date version of the requested data, then LDIM202 retrieves the requested data from storage device 110 and passes the data back to the component or device from which it received the request.": Column 13: 66 and 67 to Column 14: 1 and 2, "Another approach is to add the interception and implementation of the LDIM onto the physical persistent storage device 110. This functionality would be added before the device's controller (not shown) handles requests.").

As per **Claim** 2, the rejection of **Claim** 3 is incorporated; and Kedem further discloses:

- populating a destination image with extracted contents of the source disk in which the destination image has files, attributes, and structural relationships between files identical to files, attributes, and structural relationships between files of the source disk (see Column 1: 29-38, "The contents of the hard disk (also referred to as the hard disk's "disk image" or "data image") define the user's personalized environment: ..." and 53-62, "When the persistent storage device is a hard disk, the persistent storage device data image will frequently be called a "disk image."").

As per **Claim** 4, the rejection of **Claim** 3 is incorporated; and Kedem further discloses:

- forwarding the intercepted sector-based I/O requests to the first computer over a network (see Column 10: 19-20, "In this situation, LDIM 202 merely forwards all read/write requests to the appropriate RDIM 204.").

As per **Claim** 5, the rejection of **Claim 4** is incorporated; and Kedem further discloses:

- loading an imaging client program in the memory of the first computer, the imaging client program not being resident on the source disk (see Column 9: 65-67, "RDIM 204 preferably includes image manipulation tools. The image manipulation tools allow system administrators to manipulate master data images stored on RPSD 206"); and

- passing the intercepted sector-based I/O requests to the imaging client program, the imaging client program directing the intercepted sector-based I/O requests to the source disk (see Column 10: 26-29, "It should also be noted that the propagation of write requests from LDIM 202 to RDIM 204 for the purpose of updating the master data image can be timed to best utilize the network bandwidth.").

As per **Claim 18,** Kedem discloses:

- a first computer having the source disk (see Column 8: 6-7, "The DIMS is 110 a client/server system, and thus includes a client 202 and a server 204."); and

- a second computer having a memory with an operating system and an imaging server residing therein, the imaging server including computer executable instructions having code to create a simulated source disk that is a representation of information stored on the source disk and is accessed by the operating system as a local disk; and code to mount the

simulated source disk in the second computer, with said memory including file system drivers to detect a file system of the simulated source disk and a network loopback driver intercepting sector-based I/O requests directed to the simulated source disk and retrieving source disk data from the source disk according to intercepted sector-based I/O requests intercepted by the network loopback driver (see Column 1: 29-38, "The contents of the hard disk (also referred to as the hard disk's "disk image" or "data image") define the user's personalized environment: ... " and 53-62, "When the persistent storage device is a hard disk, the persistent storage device data image will frequently be called a "disk image.""; Column 3: 62-67 to Column 4: 1-3, "The purpose of the LDIM is to imitate the LPSD. That is, the LDIM, from the computer's perspective, appears exactly like the LPSD. More specifically, the LDIM functions to intercept and process requests that are intended to be received by the LPSD, which may not be in fact installed in the computer."; Column 6: 17-19, "... the operating system directs the request to an appropriate device driver for the physical device to which the request was made."; Column 8: 6-7, "The DIMS is 110 a client/server system, and thus includes a client 202 and a server 20." and 19-21, "LDIM 202, as shown in FIG. 2, communicates with OS 102 and BIOS 104 using standard interface 112 ... " and 26-28, "To OS 102 and BIOS 104, LDIM 202 "pretends" that it is storage device 110. Thus, LDIM 202 is completely transparent to OS 102 and BIOS 104." and 43-44, "... LDIM 202 includes a "mini-booter" software program (not shown)." and 47-48, "This is done by emulating a disk with the mini-booter installed as a loader." and 63-67 to Column 9: 1, "The mini-booter displays the list of available master data images and prompts the user to select one. The mini-booter communicates the selection to LDIM 202 and then either reboots the computer or resets the BIOS's disk geometry table to the geometry of the selected master data image." and 2-4, "In the former case, LDIM 202 emulates the selected image including the geometry of the image." and 9-15, "... LDIM 202 functions to intercept requests (for example, read/write requests) that are intended to be received by storage device 110. After a master data image is selected, upon intercepting a read request, LDIM 202 is programmed to determine whether the cached data image or the selected master data image has the most up to date version of the requested data." and 28-32, "If LDIM 202 determines that the cached data image has the most up to date version of the requested data, then LDIM 202 retrieves the requested data from storage device 110 and passes the data back to the component or device from which it received the request."; Column 13: 66 and 67 to Column 14: 1 and 2, "Another approach is to add the interception and implementation of the LDIM onto the physical persistent storage device 110. This functionality would be added before the device's controller (not shown) handles requests.").

As per **Claim 19**, the rejection of **Claim 18** is incorporated; and Kedem discloses:

- a network adapter, residing in said memory, to forward the intercepted sector-based I/O requests to the first computer (see Column 10: 19-20, "In this situation, LDIM 202 merely forwards all read/write requests to the appropriate RDIM 204." and 49-51, "LDIM card 308 is equipped with an embedded processor, logic circuits, and memory 310 for enabling LDIM 202 to perform its functions.").

As per **Claim 20**, the rejection of **Claim 19** is incorporated; and Kedem discloses:

- a first computer memory within the first computer (see Figure 1: 110); and

- an imaging client installed in the first computer memory (see Column 9: 65-67, "RDIM 204 preferably includes image manipulation tools. The image manipulation tools allow system administrators to manipulate master data images stored on RPSD 206."), said imaging client comprising computer-executable instructions that include code to receive any source disk I/O requests issued from the second computer to the first computer, code to direct the intercepted sector-based I/O requests to the source disk, and code to pass the retrieved

> source disk data to the second computer in response to the source disk I/O requests (see Column 9: 9-15, "... LDIM 202 functions to intercept requests (for example, read/write requests) that are intended to be received by storage device 110. After a master data image is selected, upon intercepting a read request, LDIM 202 is programmed to determine whether the cached data image or the selected master data image has the most up to date version of the requested data." and 28-32, "If LDIM 202 determines that the cached data image has the most up to date version of the requested data, then LDIM 202 retrieves the requested data from storage device 110 and passes the data back to the component or device from which it received the request."; Column 10: 26-29, "It should also be noted that the propagation of write requests from LDIM 202 to RDIM 204for the purpose of updating the master data image can be timed to best utilize the network bandwidth.").

Applicants respectfully traverse this rejection.

As to claim 3: Applicants respectfully submit that Kedem does not disclose loop-back mounting a simulated source disk. In particular, as the Examiner has asserted, LDIM 202 "pretends" it is storage device 110 so that LDIM 202 is completely transparent to OS 102. However, Applicants respectfully submit that this is completely different from **mounting** a disk, and in addition, when the simulated disk is mounted, **unlike** Kedem where the OS is unaware of LDIM 202, in accordance with the invention of claim 3, the operating system in the second computer system is aware of the simulated disk.

As set forth at paragraph [0167] of the specification of the present patent application, "Using the loop-back mounting method, the imaging server 2101 makes the source computer's source disk 1010 (i.e., the source disk) appear as a local disk from the server operating system's 2200 perspective; this local disk is referred to as "simulated source disk" 2210." And at paragraph [0168] of the specification, "A loop-back driver 2211N presents (simulates plug-in of) the simulated source disk to the server operating system 2200, causing it to detect the disk and instruct each of a set of installed and registered file system drivers 2212 to inspect the disk to find any file system that it recognizes. Note that the simulated source disk will appear to the server OS 2200 as any other new disk device, such as a Firewire or USB external hard disk that a user can hot-plug into a running computer. To the server OS, the simulated source disk will thus look like an actual physical device, and the OS will try to send IO requests to it. (Emphasis added)"

U.S. Patent No. 5,991,542 ("Han") cited by the Examiner describes **mounting** as follows at col. 4, lines 32-35: "The mounting of a storage medium refers to the process by which information is provided to the file management facility of a computer's operating system, so that the computer can access information on the storage medium." In addition, Han states the following regarding

mounting at col. 4, line 67-col. 5, line 9: "Each time a volume is mounted, the file manager reads the volume information from the logical block and stores it in a predetermined area of the computer's working memory, e.g. its RAM. Once the file manager has retrieved and stored the volume information, the volume is considered to be mounted, and the file manager can access information contained in the remaining blocks of the volume. A volume becomes unmounted when the file manager releases the memory that was used to store the volume information."

As the Examiner can readily appreciate from the above, Kedem does **not** teach or disclose in any manner **mounting** a simulated source disk in the second computer so that the simulated source disk is accessible by the operating system as a local disk since Kedem does not teach mounting LDIM 202.

In addition, Applicants respectfully submit that Kedem does not disclose configuring the simulated source disk as a proxy for the source disk by intercepting sector-based I/O requests and retrieving source disk data from the source disk according to the intercepted requests. In particular, in Kedem, LDIM 202 intercepts requests for a real storage device, i.e., storage device 110, on computer 100, **whereas**, in accordance with the invention of claim 3, sector-based I/O requests aimed at a simulated disk are intercepted, and disk data are retrieved from a real disk on a second computer.

In light of the above, Applicants respectfully submit that claim 3 is not anticipated by Kedem.

As to claim 2: Claim 2 depends from claim 3. As such, Applicants submit that claim 2 is not anticipated by Kedem for the same reasons set forth above with respect to claim 3. In addition, Applicants respectfully submit that nothing in Kedem discloses, in any manner whatsoever, a step of "populating a destination image with extracted contents of the source disk in which the destination image has files, attributes, and structural relationships between files identical to files, attributes, and structural relationships between files associated with the source disk."

In light of the above, Applicants respectfully submit that claim 2 is not anticipated by Kedem.

As to claim 4: Claim 4 depends from claim 3. As such, Applicants submit that claim 4 is not anticipated by Kedem for the same reasons set forth above with respect to claim 3.

As to claim 5: Claim 5 depends from claims 3 and 4. As such, Applicants submit that claim 5 is not anticipated by Kedem for the same reasons set forth above with respect to claims 3 and 4. In addition, Applicants respectfully submit that nothing in Kedem discloses, in any manner whatsoever,

a step of "loading an imaging client program in the memory of the first computer, the imaging client program not being resident on the source disk. (Emphasis added)"

In light of the above, Applicants respectfully submit that claim 5 is not anticipated by Kedem.

As to claim 18: Applicants respectfully submit that claim 18 requires code to mount a simulated source disk in a second computer. As set forth above in response to the rejection of claim 3, even assuming (for sake of argument) that LDIM 202 is a simulated source disk (it is not), Kedem does not teach mounting a simulated source disk (see the discussion of mounting set forth above with respect to the rejection of claim 3). In addition, even assuming for sake of argument that LDIM 202 is a simulated source disk (it is not), Kedem does not disclose memory in the second computer including file system drivers to detect a file system of the simulated source disk.

In light of the above, Applicants respectfully submit that claim 18 is not anticipated by Kedem.

As to claim 19: Claim 19 depends from claim 18. As such, Applicants submit that claim 19 is not anticipated by Kedem for the same reasons set forth above with respect to claim 18.

In light of the above, Applicants respectfully submit that claim 19 is not anticipated by Kedem.

As to claim 20: Claim 20 depends from claims 18 and 19. As such, Applicants submit that claim 20 is not anticipated by Kedem for the same reasons set forth above with respect to claims 18 and 19. In addition, Applicants respectfully submit that nothing in Kedem discloses, in any manner whatsoever, a step of "loading an imaging client program in the memory of the first computer, the imaging client program not being resident on the source disk. (Emphasis added)"

In light of the above, Applicants respectfully submit that claim 20 is not anticipated by Kedem.

In light of the above, Applicants respectfully request that the Examiner withdraw this rejection.

Claim 6 is rejected under 35 U.S.C. 103(a). In particular, the Examiner stated:

> **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Kedem** in view of **US 7,000,231 (hereinafter "Gold")**.
>
> As per **Claim 6**, the rejection of **Claim 5** is incorporated; however, Kedem does not disclose:

- loading a secondary operating system in the memory of the first computer, said secondary operating system not being present on the source disk and mediating I/O requests between an imaging client program and the source disk.

Gold discloses:

- loading a secondary operating system in the memory of the first computer, said secondary operating system not being present on the source disk and mediating I/O requests between an imaging client program and the source disk (see Column 3: 23-28, "A utility can then be used to reset a system identification of the computer entity, before switching to a secondary operating system to complete a build process." and 38-40, "A build process under control of a secondary "emergency" operating system can copy a fully installed primary operating system onto an operating system back-up volume.").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Gold into the teaching of Kedem to include loading a secondary operating system in the memory of the first computer, said secondary operating system not being present on the source disk and mediating I/O requests between an imaging client program and the source disk. The modification would be obvious because one of ordinary skill in the art would be motivated to guarantee creation of an uncorrupted complete copy of the primary operating system (see Gold -Column 3: 41-43).

Applicants respectfully traverse this rejection.

Claim 6 requires "loading a secondary operating system in the memory of the first computer, said secondary operating system not being present on the source disk. (Emphasis added)" However, Gold teaches the opposite. For example, at col. 3, lines 52-62 Gold states: "According to a first aspect of the present invention there is provided a method of manufacture of an operating system master disk template for installing at least one operating system onto a computer entity, said manufacturing method comprising the steps of: building a primary operating system on a first partition of a data storage device; building a secondary operating system on a second partition of said data storage device; and building an installation component on a third partition of said data storage device. (Emphasis added)" In addition, at col. 3, line 63-col. 4, line 10, Gold states: "According to a second aspect of the present invention there is provided a method of manufacture of a computer entity, said computer entity comprising at least one data processor and at least one data storage device, said method characterized by the steps of: partitioning said data storage device into a plurality of partitions; installing a primary operating system onto a first said partition of said data storage device; installing a secondary operating system onto a secondary said partition of said data device; installing an initialization component onto a third partition of said data storage device; and after installation of said primary and secondary operating systems, deleting said installation component. (Emphasis added)" In further addition, at col. 4, lines 25-40, Gold states: "According to

a third aspect of the present invention there is provided a method of producing a production version of an operating system for installation into a production version computer entity, said method comprising the steps of: creating an operating system master disk template having a plurality of partitions, wherein a primary operating system is stored on a first said partitions, a secondary operating system is stored on a second said partition, and an installation component is stored on a third said partition; loading said master disk template into a mastering computer entity to create an image of said master disk template on said mastering computer entity; and replicating said master disk image by loading said master disk image from said mastering computer entity onto said production computer entity. (Emphasis added)"

Applicants respectfully submit that even if a person of ordinary skill in the art were to combine Kedem and Gold in the manner suggested by the Examiner, that person would not arrive at the invention of claim 6 at least because that person would store a second operating system on the source disk. As such, Applicants respectfully submit that claim 6 is patentable over Kedem in view of Gold.

In light of the above, Applicants respectfully request that the Examiner withdraw this rejection.

Claims 7-8, 12-13, 15-16, 21-23 and 27 are rejected under 35 U.S.C. 103(a). In particular, the Examiner stated:

> **Claims 7, 8, 12, 13, 15, 16, 21-23, and 27** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kedem** in view of **US 5,991,542 (hereinafter "Han")**.
>
> As per **Claim 7**, the rejection of **Claim 2** is incorporated; and Kedem further discloses:
>
> - mounting the destination image in an uninitialized state in the second computer as a simulated destination disk (see Column 8: 63-67 to Column 9: 1, "The mini-booter displays the list of available master data images and prompts the user to select one. The mini-booter communicates the selection to LDIM 202 and then either reboots the computer or resets the BIOS's disk geometry table to the geometry of the selected master data image.");
>
> - intercepting sector-based I/O requests directed to the simulated destination disk and directing the contents of the intercepted sector-based I/O requests to the destination image (see Column 9: 9-15, "... LDIM 202 functions to intercept requests (for example, read/write requests) that are intended to be received by storage device 110. After a master data image is selected, upon intercepting a read request, LDIM 202 is programmed to determine whether the cached data image or the selected master data image has the most up to date version of the requested data."); and
>
> - copying files of at least one file system of the simulated source disk to the

corresponding file system of the simulated destination disk (see Column 9: 48-51, "It is envisioned that a user who uses the DIMS would initially copy the data image stored on storage device 110 onto RPSD 206 and then always select that image as the master data image.").

However, Kedem does not disclose:

- retrieving partition and file system layout information from the source disk; and

- formatting the simulated destination image to have the same partitioning and file system(s) as the simulated source disk and thus of the source disk.

Han discloses:

- retrieving partition and file system layout information from the source disk (see Column 4: 41-44, "A larger storage device, such as a hard disk or a file server, can be divided into many different volumes, or partitions, each of which can be formatted in a different manner."); and

- formatting the simulated destination image to have the same partitioning and file system as the simulated source disk and thus of the source disk (see Column 4: 64-67, "This information is initially created when the volume is initialized, or formatted, and modified thereafter whenever the file management system writes information to the volume.").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Han into the teaching of Kedem to include retrieving partition and file system layout information from the source disk; and formatting the simulated destination image to have the same partitioning and file system as the simulated source disk and thus of the source disk. The modification would be obvious because one of ordinary skill in the art would be motivated to create a disk image that has properties of the physical storage device (see Han -Column 3: 30-34).

As per **Claim** 8, the rejection of **Claim 7** is incorporated; and Kedem further discloses:

- converting the intercepted sector-based I/O requests to the simulated destination disk into sector accesses within the destination image (see Column 9: 36-39, "Upon receiving the read request, RDIM 204 locates and reads the requested data from the selected master data image stored on RPSD 206 and then transmits the data back to LDIM 202.").

As per **Claim 12,** the rejection of **Claim 7** is incorporated; and Kedem further discloses: in which the source disk is a source virtual disk (see Column 1: 53-62, "When the persistent storage device is a hard disk, the persistent storage device data image will frequently be called a "disk image."").

As per **Claim 13,** the rejection of **Claim 12** is incorporated; and Kedem further discloses:

- in which the destination disk is a physical disk (see Figure 1: 110).

As per **Claim 15,** the rejection of **Claim 7** is incorporated; and Kedem further discloses:

- in which the first computer is the same as the second computer (see Column 8: 6-

7, "The DIMS is 110 a client/server system, and thus includes a client 202 and a server 204.").

As per **Claim 16,** Kedem discloses:

- in a second computer that includes an operating system that has file system software that detects a file system of disks mounted in the second computer, while the source disk is in an unmodified, unprepared state, extracting the contents of the source disk, defining extracted contents, and populating a destination image with the extracted contents of the source disk such that the destination image may have a different sector-by-sector content than the source disk but a destination file system logically equivalent to the at least one source file system, with identical files, attributes, and structural relationships between files as the source disk (see Column 1: 2938, "The contents of the hard disk (also referred to as the hard disk's "disk image" or "data image") define the user's personalized environment: ... " and 53-62, "When the persistent storage device is a hard disk, the persistent storage device data image will frequently be called a "disk image.""; Column 8: 6-7, "The DIMS is 110 a client/server system, and thus includes a client 202 and a server 204.");

- mounting a simulated source disk in the second computer so that the simulated source disk is accessible by the operating system as a local disk (see Column 8: 63-67 to Column 9: 1, "The mini-booter displays the list of available master data images and prompts the user to select one. The mini-booter communicates the selection to LDIM 202 and then either reboots the computer or resets the BIOS's disk geometry table to the geometry of the selected master data image.");

- configuring the simulated source disk as a proxy for the source disk by intercepting sector-based I/O requests directed to the simulated source disk and retrieving source disk data from the source disk according to the intercepted sector-based I/O requests (see Column 9: 9-15, "... LDIM 202 functions to intercept requests (for example, read/write requests) that are intended to be received by storage device 110. After a master data image is selected, upon intercepting a read request, LDIM 202 is programmed to determine whether the cached data image or the selected master data image has the most up to date version of the requested data." and 28-32, "If LDIM 202 determines that the cached data image has the most up to date version of the requested data, then LDIM 202 retrieves the requested data from storage device 110 and passes the data back to the component or device from which it received the request.");

- forwarding the intercepted sector-based I/O requests to the first computer (see Column 10: 19-20, "In this situation, LDIM 202 merely forwards all read/write requests to the appropriate RDIM 204.");

- loading an imaging client program into a memory of the first computer (see Column 9: 65-67, "RDIM 204 preferably includes image manipulation tools. The image manipulation tools allow system administrators to manipulate master data images stored on RPSD 206.");

- passing the intercepted sector-based I/O requests to the imaging client program, the imaging client program directing the intercepted sector-based I/O requests to the source disk (see Column 10: 26-29, "It should also be noted that the propagation of write requests from LDIM 202 to RDIM 204 for the purpose of updating the master data image can be timed to best utilize the network bandwidth.");

- mediating, by the operating system, sector-based I/O requests between the imaging client program and the source disk (see Column 6: 12-18, "1. An application wishing

to read or write a file issues a request to an operating system API for such action." and "3. On a miss, or write through, the operating system directs the request to an appropriate device driver for the physical device to which the request was made."; Column 8: 19-21, "LDIM 202, as shown in FIG. 2, communicates with OS 102 and BIOS 104 using standard interface 112 ... "; Column 9: 9-11, "As is evident from FIG. 2, LDIM 202 functions to intercept requests (for example, read/write requests) that are intended to be received by storage device 110.");

- mounting the destination image in an uninitialized state in the second computer as a simulated destination disk (see Column 8: 63-67 to Column 9: 1, "The mini-booter displays the list of available master data images and prompts the user to select one. The mini-booter communicates the selection to LDIM 202 and then either reboots the computer or resets the BIOS's disk geometry table to the geometry of the selected master data image.");

- intercepting sector-based I/O requests directed to the simulated destination disk and directing results of the intercepted sector-based I/O requests to the destination image (see Column 9: 9-15, "... LDIM 202 functions to intercept requests (for example, read/write requests) that are intended to be received by storage device 110. After a master data image is selected, upon intercepting a read request, LDIM 202 is programmed to determine whether the cached data image or the selected master data image has the most up to date version of the requested data.");

- converting the intercepted sector-based I/O requests to the simulated destination disk into sector accesses within the destination image (see Column 9: 36-39, "Upon receiving the read request, RDIM 204 locates and reads the requested data from the selected master data image stored on RPSD 206 and then transmits the data back to LDIM 202."); and

- copying files of at least one file system of the simulated source disk to the corresponding file system of the simulated destination disk (see Column 9: 48-51, "It is envisioned that a user who uses the DIMS would initially copy the data image stored on storage device 110 onto RPSD 206 and then always select that image as the master data image.").

However, Kedem does not disclose:

- retrieving partition and file system layout information from the source disk; and

- formatting the simulated destination image to have the same partitioning and file system(s) as the simulated source disk and thus of the source disk.

Han discloses:

- retrieving partition and file system layout information from the source disk (see Column 4: 41-44, "A larger storage device, such as a hard disk or a file server, can be divided into many different volumes, or partitions, each of which can be formatted in a different manner."); and

- formatting the simulated destination image to have the same partitioning and file system(s) as the simulated source disk and thus of the source disk (see Column 4: 64-67, "This information is initially created when the volume is initialized, or formatted, and modified thereafter whenever the file management system writes information to the volume.").

Therefore, it would have been obvious to one of ordinary skill in the art at the time

the invention was made to incorporate the teaching of Han into the teaching of Kedem to include retrieving partition and file system layout information from the source disk; and formatting the simulated destination image to have the same partitioning and file system(s) as the simulated source disk and thus of the source disk. The modification would be obvious because one of ordinary skill in the art would be motivated to create a disk image that has properties of the physical storage device (see Han -Column 3: 30-34).

As per **Claim 21,** the rejection of **Claim 18** is incorporated; and Kedem further discloses:

- wherein the imaging server further includes code to generate a simulated destination disk in response to the second computer mounting the destination image, with said memory further including a local loopback driver, a local adapter and a formatting module, with the local loopback driver intercepting sector-based I/O requests directed to the simulated destination disk and the local adapter comprising code to convert the intercepted sector-based I/O requests to the simulated destination disk into sector accesses within the destination image, the imaging server having code to copy files of at least one file system of the simulated source disk to the corresponding file system of the simulated destination disk (see Column 8: 63-67 to Column 9: 1, "The mini-booter displays the list of available master data images and prompts the user to select one. The mini-booter communicates the selection to LDIM 202 and then either reboots the computer or resets the BIOS's disk geometry table to the geometry of the selected master data image."; Column 9: 9-15, "... LDIM 202 functions to intercept requests (for example, read/write requests) that are intended to be received by storage device 110. After a master data image is selected, upon intercepting a read request, LDIM 202 is programmed to determine whether the cached data image or the selected master data image has the most up to date version of the requested data." and 36-39, "Upon receiving the read request, RDIM 204 locates and reads the requested data from the selected master data image stored on RPSD 206 and then transmits the data back to LDIM 202." and 48-51, "It is envisioned that a user who uses the DIMS would initially copy the data image stored on storage device 110 onto RPSD 206 and then always select that image as the master data image.").

However, Kedem does not disclose:

- the local loopback driver retrieving partition and file system layout information from the source disk; and

- the formatting module comprising code to format the destination image to have the same partitioning and file system(s) as the simulated source disk and thus of the source disk.

Han discloses:

- the local loopback driver retrieving partition and file system layout information from the source disk (see Column 4: 41-44, "A larger storage device, such as a hard disk or a file server, can be divided into many different volumes, or partitions, each of which can be formatted in a different manner."); and

- the formatting module comprising code to format the destination image to have the same partitioning and file system(s) as the simulated source disk and thus of the source disk (see Column 4: 64-67, "This information is initially created when the volume is initialized, or formatted, and modified thereafter whenever the file management system writes information to the volume.").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Han into the teaching of Kedem to include the local loopback driver retrieving partition and file system layout information from the source disk; and the formatting module comprising code to format the destination image to have the same partitioning and file system(s) as the simulated source disk and thus of the source disk. The modification would be obvious because one of ordinary skill in the art would be motivated to create a disk image that has properties of the physical storage device (see Han -Column 3: 30-34).

As per **Claim** 22, the rejection of **Claim 21** is incorporated; and Kedem further discloses:

- in which the source disk is a virtual disk (see Column 1: 53-62, "When the persistent storage device is a hard disk, the persistent storage device data image will frequently be called a "disk image."").

As per **Claim** 23, the rejection of **Claim 22** is incorporated; and Kedem further discloses:

- in which the destination disk is a physical disk (see Figure 1: 110).

As per **Claim** 27, Kedem discloses:

- a second computer (see Column 8: 6-7, "The DIMS is 110 a client/server system, and thus includes a client 202 and a server 204.");

- a server operating system that resides in the second computer (see Column 8: 6-7, "The DIMS is 110 a client/server system, and thus includes a client 202 and a server 204.");

- file system drivers within operating system of the second computer automatically detecting at least one file system of disks mounted in the second computer (see Column 6: 17-19, "... the operating system directs the request to an appropriate device driver for the physical device to which the request was made.");

- an imaging server running within the second computer (see Column 8: 43-44, " LDIM 202 includes a "mini-boater" software program (not shown).") and comprising computer-executable instructions:

- for extracting the contents of the source disk, defining extracted contents, and populating a destination image with the extracted contents of the source disk such that the destination image may have a different sector-by-sector content than the source disk but a destination file system logically equivalent to the at least one source file system (see Column 1: 29-38, "The contents of the hard disk (also referred to as the hard disk's "disk image" or "data image") define the user's personalized environment: ... " and 53-62, "When the persistent storage device is a hard disk, the persistent storage device data image will frequently be called a "disk image."");

- for creating a simulated source disk corresponding to the source disk (see Column 8: 47-48, "This is done by emulating a disk with the mini-booter installed as a loader.");

- while the source disk is in an unmodified, unprepared state, for mounting the simulated source disk in the second computer, file system drivers thereby automatically detecting a file system of the simulated source disk and therefore of the source disk and exposing a file system to software running on the second computer (see Column 8: 63-67 to

Column 9: 1, "The mini-booter displays the list of available master data images and prompts the user to select one. The mini-booter communicates the selection to LDIM 202 and then either reboots the computer or resets the BIOS's disk geometry table to the geometry of the selected master data image.");

- a network loopback driver intercepting sector-based I/O requests directed to the simulated source disk (see Column 9: 9-15, "... LDIM 202 functions to intercept requests (for example, read/write requests) that are intended to be received by storage device 110. After a master data image is selected, upon intercepting a read request, LDIM 202 is programmed to determine whether the cached data image or the selected master data image has the most up to date version of the requested data.");

- a network adapter forwarding the intercepted sector-based I/O requests to the first computer (see Column 10: 19-20, "In this situation, LDIM 202 merely forwards all read/write requests to the appropriate RDIM 204.");

- an imaging client installed in the memory of the first computer (see Column 9: 65-67, "RDIM 204 preferably includes image manipulation tools. The image manipulation tools allow system administrators to manipulate master data images stored on RPSD 206."), said imaging client comprising computer-executable instructions:

- for receiving any source disk I/O requests issued from the second computer to the first computer (see Column 9: 9-15, "... LDIM 202 functions to intercept requests (for example, read/write requests) that are intended to be received by storage device 110."),

- for directing the intercepted sector-based I/O requests to the source disk (see Column 9: 9-15, "After a master data image is selected, upon intercepting a read request, LDIM 202 is programmed to determine whether the cached data image or the selected master data image has the most up to date version of the requested data."), and

- for passing to the second computer source disk data retrieved in response to the source disk I/O requests (see Column 9: 28-32, "If LDIM 202 determines that the cached data image has the most up to date version of the requested data, then LDIM 202 retrieves the requested data from storage device 110 and passes the data back to the component or device from which it received the request. "; Column 10: 26-29, "It should also be noted that the propagation of write requests from LDIM 202 to RDIM 204 for the purpose of updating the master data image can be timed to best utilize the network bandwidth.");

- a local loopback driver intercepting sector-based I/O requests directed to the simulated destination disk (see Column 9: 9-15, "... LDIM 202 functions to intercept requests (for example, read/write requests) that are intended to be received by storage device 110. After a master data image is selected, upon intercepting a read request, LDIM 202 is programmed to determine whether the cached data image or the selected master data image has the most up to date version of the requested data.");

- a local adapter comprising computer-executable instructions for converting the intercepted sector-based I/O requests to the simulated destination disk into sector accesses within the destination image (see Column 9: 36-39, "Upon receiving the read request, RDIM 204 locates and reads the requested data from the selected master data image stored on RPSD 206 and then transmits the data back to LDIM 202."); and

- the imaging server further comprising computer-executable instructions for copying files of at least one file system of the simulated source disk to the corresponding file system of the simulated destination disk (see Column 9: 48-51, "It is envisioned that a user

who uses the DIMS would initially copy the data image stored on storage device 110 onto RPSD 206 and then always select that image as the master data image.").

However, Kedem does not disclose:

- a simulated destination disk generated by mounting the destination image in an uninitialized state in the second computer;

- a local loopback driver retrieving partition and file system layout information from the source disk; and

- a formatting module comprising computer-executable instructions for formatting the destination image to have the same partitioning and file system as the simulated source disk and thus of the source disk.

Han discloses:

- a simulated destination disk generated by mounting the destination image in an uninitialized state in the second computer (see Column 4: 23-26, "In accordance with the present invention, the efficiency with which the downloading operation can be carried out is enhanced by making the disk image file mountable in each target computer 10.");

- a local loopback driver retrieving partition and file system layout information from the source disk (see Column 4: 41-44, "A larger storage device, such as a hard disk or a file server, can be divided into many different volumes, or partitions, each of which can be formatted in a different manner."); and

- a formatting module comprising computer-executable instructions for formatting the destination image to have the same partitioning and file system as the simulated source disk and thus of the source disk (see Column 4: 64-67, "This information is initially created when the volume is initialized, or formatted, and modified thereafter whenever the file management system writes information to the volume.").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Han into the teaching of Kedem to include a simulated destination disk generated by mounting the destination image in an uninitialized state in the second computer; a local loopback driver retrieving partition and file system layout information from the source disk; and a formatting module comprising computer-executable instructions for formatting the destination image to have the same partitioning and file system as the simulated source disk and thus of the source disk. The modification would be obvious because one of ordinary skill in the art would be motivated to create a disk image that has properties o f the physical storage device (see Han -Column 3: 30-34).

Applicants respectfully traverse the Examiner's rejection.

As to claim 7: Applicants respectfully submit that Kedem does not teach or disclose in any manner loop-back mounting a simulated source disk in the second computer (as required by claim 3 from which claim 7 depends) as discussed above with respect to the rejection of claim 3. Further, Applicants respectfully submit that Kedem does not teach or disclose in any manner mounting the destination image in an uninitialized state in the second computer as a simulated destination disk as

required by claim 7. In particular, Kedem does not teach any simulated destination disk. However, even if LDIM 202 were such a simulated destination disk (as the Examiner asserts), Kedem does **not** teach or disclose that it is mounted in an uninitialized state. Further, as described above with respect to the rejection of claim 3, Kedem does **not** teach or disclose mounting LDIM 202.

The Examiner asserts that Kedem discloses "copying files of at least one file system of the simulated source disk to the corresponding file system of the simulated destination disk" by the language "It is envisioned that a user who uses the DIMS would initially copy the data image stored on storage device 110 onto RPSD 206 and then always select that image as the master data image." However, neither storage device 110 nor RPSD is a simulated source disk or a simulated destination disk.

The Examiner asserts that Han teaches "formatting the simulated destination image to have the same partitioning and file system as the simulated source disk and thus of the source disk" at col. 4, lines 64-67 which (only) states that a volume is formatted when it is initialized. Applicants respectfully submit that this assertion completely omits the fact that neither Kedem nor Han teaches or discloses "formatting the simulated destination image to have the same partitioning and file system as the simulated source disk and thus of the source disk. (Emphasis added)"

Lastly, even if a person of ordinary skill in the art were to combine Kedem and Han in the manner suggested by the Examiner, that person would not arrive at the invention of claim 7 because Kedem and Han do not disclose the missing elements discussed above. Hence, nothing in Kedem or Han would make the invention of claim 7 obvious.

As such, Applicants respectfully submit that claim 7 is patentable over Kedem in view of Han.

As to claim 8: Claim 8 depends from claim 7. As such, Applicants respectfully submit that claim 8 is patentable over Kedem in view of Han for the same reasons set forth above with respect to claim 7.

As to claim 12: Claim 12 depends from claim 7. As such, Applicants respectfully submit that claim 12 is patentable over Kedem in view of Han for the same reasons set forth above with respect to claim 7. In addition, neither Kedem nor Han teaches or discloses a virtual disk (see the specification at paragraphs (0093) and (0150), among others, referring to virtual disks). As such, even if a person of ordinary skill in the art were to combine Kedem and Han in the manner suggested

by the Examiner, that person would not arrive at the invention of claim 12 because Kedem and Han do not disclose the missing element, i.e., the source virtual disk, required by claim 12. Hence, nothing in Kedem or Han would make the invention of claim 12 obvious.

As to claim 13: Claim 13 depends from claims 7 and 12. As such, Applicants respectfully submit that claim 13 is patentable over Kedem in view of Han for the same reasons set forth above with respect to claims 7 and 12. In addition, neither Kedem nor Han teaches, discloses or suggests in any manner creating an image of a virtual disk on a physical disk. Hence, nothing in Kedem or Han would make the invention of claim 13 obvious.

As such, Applicants respectfully submit that claim 13 is patentable over Kedem in view of Han.

As to claim 15: Claim 15 depends from claim 7. As such, Applicants respectfully submit that claim 15 is patentable over Kedem in view of Han for the same reasons set forth above with respect to claim 7.

As to claim 16: Applicants respectfully submit that claim 16 is patentable over Kedem in view of Han for at least the following reasons: (a) neither Kedem nor Han teaches or discloses in any manner mounting a simulated source disk in the second computer as discussed above with respect to the rejection of claim 7; and (b) neither Kedem nor Han teaches or discloses in any manner mounting the destination image in an uninitialized state in the second computer as a simulated destination disk as discussed above with respect to the rejection of claim 7. Hence, nothing in Kedem or Han would make the invention of claim 16 obvious.

As to claim 21: Claim 21 depends from claim 18. As such, Applicants respectfully submit that claim 21 is patentable over Kedem in view of Han for the same reasons set forth above with respect to claim 18.

As to claim 22: Claim 22 depends from claims 18 and 21. As such, Applicants respectfully submit that claim 22 is patentable over Kedem in view of Han for the same reasons set forth above with respect to claims 18 and 21. In addition, as set forth above in regard to the rejection of claim 12, neither Kedem nor Han teaches or discloses a virtual disk (see the specification at paragraphs 0093 and 0150, among others, referring to virtual disks). As such, even if a person of ordinary skill in the art were to combine Kedem and Han in the manner suggested by the Examiner, that person would not arrive at the invention of claim 22 because Kedem and Han do not disclose the missing

element, i.e., the source virtual disk, required by claim 22. Hence, nothing in Kedem or Han would make the invention of claim 22 obvious.

As such, Applicants respectfully submit that claim 22 is patentable over Kedem in view of Han.

As to claim 23: Claim 23 depends from claims 18, 21 and 22. As such, Applicants respectfully submit that claim 23 is patentable over Kedem in view of Han for the same reasons set forth above with respect to claims 18, 21 and 22. In addition, neither Kedem nor Han teaches, discloses or suggests in any manner creating an image of a virtual disk on a physical disk. Hence, nothing in Kedem or Han would make the invention of claim 23 obvious.

As such, Applicants respectfully submit that claim 23 is patentable over Kedem in view of Han.

As to claim 27: Applicants respectfully submit that claim 27 is patentable over Kedem in view of Han for at least the following reasons: (a) neither Kedem nor Han teaches or discloses in any manner mounting a simulated source disk in the second computer as discussed above with respect to the rejection of claim 7; and (b) neither Kedem nor Han teaches or discloses in any manner mounting the destination image in an uninitialized state in the second computer as a simulated destination disk as discussed above with respect to the rejection of claim 7. Hence, nothing in Kedem or Han would make the invention of claim 27 obvious.

In light of the above, Applicants respectfully request that the Examiner withdraw this rejection.

Claim 9-11 and 14 are rejected under 35 U.S.C. 103(a). In particular, the Examiner stated:

> **Claims 9-11 and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kedem** in view of **Han** as applied to Claims 7 and 21 above, and further in view of **US 6,075,938 (hereinafter "Bugnion").**
>
> As per **Claim 9**, the rejection of **Claim 7** is incorporated; however, Kedem and Han do not disclose:
>
> - in which the destination image is a virtual disk file associated with a virtual computer.
>
> Bugnion discloses:
>
> - in which the destination image is a virtual disk file associated with a virtual computer (see Column 10: 5-7, "Disco virtualizes disks by providing a set of virtual disks that any virtual machine can mount.").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Bugnion into the teaching of Kedem to include in which the destination image is a virtual disk file associated with a virtual computer. The modification would be obvious because one of ordinary skill in the art would be motivated to support different sharing and persistency models (see Bugnion -Column 10: 7-8).

As per **Claim 10,** the rejection of **Claim 9** is incorporated; and Kedem further discloses:

in which the first computer is a physical computer and the source disk is a physical disk associated with the physical computer (see Column 8: 6-7, "The DIMS is 110 a client/server system, and thus includes a client 202 and a server 204. " and 10-12, "The DIMS also includes a persistent storage device (PSD) 206 that can be read from and written to by RDIM204.").

As per **Claim 11,** the rejection of **Claim 9** is incorporated; however, Kedem and Han do not disclose:

- in which the virtual disk file is a sparse virtual disk, having a predetermined capacity and initial sector contents with null values.

Official Notice is taken that it is old and well-known within the computing art to utilize a sparse virtual disk. Applicant has submitted in the "Background of the Invention" section of the specification that a VMM may implement a virtual disk using a sparse, sector-based image format (see Page 21, Paragraph [0094]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include in which the virtual disk file is a sparse virtual disk, having a predetermined capacity and initial sector contents with null values. The modification would be obvious because one of ordinary skill in the art would be motivated to keep the virtual disk files small (see Page 21, Paragraph [0094]).

As per **Claim 14,** the rejection of **Claim 7** is incorporated; however, Kedem and Han do not disclose:

- in which the source disk is a first virtual disk associated with a first virtual computer and the destination disk is a second virtual disk associated with a second virtual computer.

Bugnion discloses:

in which the source disk is a first virtual disk associated with a first virtual computer and the destination disk is a second virtual disk associated with a second virtual computer (see Column 10: 5-7, "Disco virtualizes disks by providing a set of virtual disks that any virtual machine can mount.").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Bugnion into the teaching of Kedem to include in which the source disk is a first virtual disk associated with a first virtual computer and the destination disk is a second virtual disk associated with a second virtual computer. The modification would be obvious because one of ordinary skill in the art would be motivated to support different sharing and persistency models (see Bugnion -Column 10: 7-8).

As per **Claim** 24, the rejection of **Claim 21** is incorporated; however, Kedem and Han do not disclose:

- in which the destination image is a virtual disk file associated with a virtual computer.

Bugnion discloses:

- in which the destination image is a virtual disk file associated with a virtual computer (see Column 10: 5-7, "Disco virtualizes disks by providing a set of virtual disks that any virtual machine can mount.").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Bugnion into the teaching of Kedem to include in which the destination image is a virtual disk file associated with a virtual computer. The modification would be obvious because one of ordinary skill in the art would be motivated to support different sharing and persistency models (see Bugnion -Column 10: 7-8).

As per **Claim** 25, the rejection of **Claim 24** is incorporated; however, Kedem and Han do not disclose:

- in which the first computer is a physical computer and the source disk is a physical disk associated with the physical computer.

Bugnion discloses:

- in which the first computer is a physical computer and the source disk is a physical disk associated with the physical computer (see Column 10: 5-7, "Disco virtualizes disks by providing a set of virtual disks that any virtual machine can mount.").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Bugnion into the teaching of Kedem to include in which the first computer is a physical computer and the source disk is a physical disk associated with the physical computer. The modification would be obvious because one of ordinary skill in the art would be motivated to support different sharing and persistency models (see Bugnion - Column 10: 7-8).

Applicants respectfully traverse the Examiner's rejection.

As to claim 9: Claim 9 depends from claim 7. As such, Applicants repeat the arguments set forth above with respect to Kedem and Han. Namely, Applicants respectfully submit that Kedem does not teach or disclose in any manner loop-back mounting a simulated source disk in the second computer (as required by claim 3 from which claims 7 and 9 depend) as discussed above with respect to the rejection of claim 3. Further, Applicants respectfully submit that Kedem does not teach or disclose in any manner mounting the destination image in an uninitialized state in the second computer as a simulated destination disk as required by claims 7 and 9. In particular, Kedem does not teach any simulated destination disk. However, even if LDIM 202 is such a simulated

destination disk (as the Examiner asserts), Kedem does not teach or disclose that it is mounted in an uninitialized state. Further, as described above with respect to the rejection of claim 3, Kedem does not teach or disclose mounting LDIM 202.

As additionally set forth above in response to the rejection of claim 7, neither Kedem nor Han teaches or discloses "formatting the simulated destination image to have the same partitioning and file system as the simulated source disk and thus of the source disk. (Emphasis added)"

In addition, Applicants respectfully submit that Bugnion does not make up for any of these deficiencies. Thus, even if a person of ordinary skill in the art were to combine Kedem and Han and Bugnion in the manner suggested by the Examiner, that person would not arrive at the invention of claim 9 because neither Kedem nor Han nor Bugnion disclose the missing elements discussed above. Hence, nothing in Kedem or Han or Bugnion would make the invention of claim 9 obvious.

Lastly, a person of ordinary skill in the art would not be motivated to have a destination image as a virtual disk file for the reasons set forth in the specification of the pending patent application, namely, as set forth at paragraph (0150): "Selecting virtual disks as a common image file format is not an obvious choice, since virtual disks use a sector-based format, and this type of format is known to have issues when used as a disk image format, as the discussion above on prior art explains. Not surprisingly, no contemporary disk imaging system uses virtual disks as image files." As additionally set forth in paragraphs (0014), (0015) and (0023): "A first disadvantage of the sector-based approach is, when an image is deployed, the destination disk must be at least as large as the original disk since the file system metadata on the original disk may encode the disk's capacity and assume that it never changes. This metadata is captured into the image file and copied to the destination disk. If the destination disk is smaller than the source disk, some sectors that the metadata assume exist may not exist on the destination disk, resulting in an inconsistent file system. Furthermore, if the destination disk is larger than the source disk, the deployed file system may not be able to take advantage of the additional space, since its metadata would assume that the disk has a smaller capacity. Another disadvantage of a sector-based format is its inefficiency. A disk may have a large number of free sectors, that is, sectors that are not used as data or metadata, and thus have no useful content. These sectors may be scattered all over the disk, and may be difficult to identify because they generally contain an undefined set of bytes. A free sector's content is undefined because the sector may have been used earlier as data or metadata, then released after a file or folder

was deleted. Most file system drivers don't erase (i.e., fill with zeros) freed sectors. A sector-based image format is therefore inefficient because it may include a disk's unused sectors. ... In summary, sector-based disk image formats are subject to two main limitations: the capacity matching problem, where the destination disk of deploy operation must be as large or larger than the source disk used to create the image, and the efficiency problem, where the image file may contain useless sectors, which unnecessarily increases its size and the time it takes to capture or deploy.

As such, Applicants respectfully submit that claim 9 is patentable over Kedem in view of Han and further in view of Bugnion.

As to claim 10: Claim 10 depends from claims 7 and 9. As such, Applicants respectfilly submit that claim 10 is patentable over Kedem in view of Han and further in view of Bugnion for the same reasons set forth above with respect to the rejection of claims 7 and 9.

As to claim 11: Claim 11 depends from claims 7 and 9. As such, Applicants respectfully submit that claim 11 is patentable over Kedem in view of Han and further in view of Bugnion for the same reasons set forth above with respect to the rejection of claims 7 and 9.

As to claim 14: Claim 14 depends from claim 7. As such, Applicants respectfully submit that claim 14 is patentable over Kedem in view of Han and further in view of Bugnion for the same reasons set forth above with respect to the rejection of claim 7. In addition, a person of ordinary skill in the art would not be motivated to have a destination image as a virtual disk file for the reasons set forth above in response to the rejection of claim 9.

As such, Applicants respectfully submit that claim 14 is patentable over Kedem in view of Han and further in view of Bugnion.

As to claim 24: Claim 24 depends from claim 21. As such, Applicants respectfully submit that claim 24 is patentable over Kedem in view of Han and further in view of Bugnion for the same reasons set forth above with respect to the rejection of claim 21. In addition, a person of ordinary skill in the art would not be motivated to have a destination image as a virtual disk file for the reasons set forth above in response to the rejection of claim 9.

As such, Applicants respectfully submit that claim 24 is patentable over Kedem in view of Han and further in view of Bugnion.

As to claim 25: Claim 25 depends from claims 21 and 24. As such, Applicants respectfully submit that claim 25 is patentable over Kedem in view of Han and further in view of Bugnion for the same reasons set forth above with respect to the rejection of claims 21 and 24.

In light of the above, Applicants respectfully request that the Examiner withdraw this rejection.

Accordingly, Applicants submit that the present Application is in condition for allowance. Applicants therefore request reconsideration of the outstanding rejections and issue a Notice of Allowance. The Examiner is invited to contact the undersigned at 650-427-1052 to discuss any additional changes the Examiner may feel is necessary in light of this Amendment.

Date: March 31, 2009

Respectfully submitted,

/Michael B. Einschlag/
Michael B. Einschlag
Reg. No. 29,301
Attorney for the Applicant

3401 Hillview Avenue
Palo Alto, California 94304
Phone: (650) 427-1052